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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,677	09/28/2001	Kiyoshi Yajima	040894-5726	3489

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EXAMINER	
SKED, MATTHEW J	

ART UNIT	PAPER NUMBER
2655	

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/964,677	YAJIMA ET AL.	
	Examiner	Art Unit	
	Matthew J Sked	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 20 December 2001 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 3/4/03, 6/13/03.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figure 9 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure and claims 1-9 are objected to because the term "voice recognition" is misused for what nowadays is called --**speech recognition**-- in the speech signal processing art. While "voice recognition" and "speech recognition" were both once used interchangeably to refer to spoken word recognition, nowadays these two terms are distinguished. The term "**voice** recognition" now denotes identification of ***who*** is doing the speaking (class 704/246), while "**speech** recognition" (or "**word** recognition") denotes identification of ***what*** is being said (class 704/251). So, appropriate correction to the proper terms of art is required.

3. The disclosure is objected to because of the following informalities: on page 3, line 18 "mulatiplicative" should be changed to –multiplicative— and on page 12, line 1 "maultiplicative" should be changed to –multiplicative--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1 and 3-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shozakai et al. ("A non-iterative model-adaptive E-CMN/PMC approach for speech recognition in car environments"), cited by the applicant.

As per claim 1, Shozakai teaches a voice recognition system comprising:

a standard acoustic model (clean HMM models, page 3, col. 2, lines 4-7);

a first feature vector generation section for reducing noise from an input signal to generate a first feature vector (performs cepstrum mean normalization on speech, page 2, col. 1, lines 1-4);

a second feature vector generation section for generating a second feature vector from the input signal having noise (performs cepstrum mean normalization on non-speech, page 2, col. 1, lines 1-4); and

a preparation section using the first feature vector, the second feature vector, the standard vector, and clean speech for preparing a speaker adaptive acoustic model suitable for the uttered voice (adapt HMM models using estimated multiplicative and additive distortions found from speech and non-speech features, page 3, col. 2, lines 35-40).

Shozakai does not specifically teach or point out having the user generate the input signal corresponding to a designated text.

However, the Examiner takes Official Notice that it is common in the art to train a speech recognition system by having a user speak designated text. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Shozakai to have the user generate the input signal corresponding to a designated text because it would allow the system to obtain the corresponding standard vector without a lengthy matching process hence having a faster adaptive process and so having more accurate speech models corresponding to the user's environment.

6. As per claim 3, Shozakai teaches that the noise includes additive noise and multiplicative noise (page 1, col. 1, lines 32-35).

7. As per claim 4, Shozakai suggests the first feature vector generation section includes an additive noise reduction section for reducing the additive noise from the input signal to generate an additive-noise reduced signal (proposes the E-CMN method for reducing noise where the additive and multiplicative noise are treated separately and the additive noise is reduced through spectrum subtraction, page 1, col. 1, lines 32-39).

8. As per claim 5, Shozakai teaches the additive noise reduction section applies a transformation to the input signal to generate a first spectrum and subtracting an additive noise spectrum corresponding to the additive noise from the first spectrum (spectrum subtraction, page 1, col. 1, lines 32-38).

9. As per claim 6, Shozakai teaches the first feature vector generation section includes a cepstrum calculator for applying cepstrum calculation to the additive-noise reduced signal (in the multiplicative noise reduction section of E-CMN method the cepstrum mean vectors are calculated for the speech, page 2, col. 1, lines 1-4).

10. As per claim 7, Shozakai teaches the first feature vector generation section includes a multiplicative noise reduction section for reducing the multiplicative noise by subtracting the multiplicative noise from the first feature vector (the E-CMN method performs cepstrum mean normalization, page 2, col. 1, lines 7-17).

11. As per claim 8, Shozakai teaches the first feature vector contains a plurality of time-series first feature vectors (short term spectra, page 1, col. 2, lines 6-9); and

the multiplicative noise reduction section calculates a time average (long-term average) of the time-series first feature vectors (short term spectra) for estimating the multiplicative noise (multiplicative noise is modeled by finding the long-term average over the short term spectra, page 1, col. 2, lines 6-9).

12. As per claim 9, Shozakai teaches the second feature vector generation section applies at least cepstrum calculation to the input signal to generate the second feature vector (calculates the cepstrum mean vector for the non-speech frames, page 2, col. 1, lines 1-7).

13. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shozakai in view of Takagi et al. (U.S. Pat. 5,890,113).

Shozakai does not teach that the preparation section compares the first feature vector with the standard vector to obtain a path search result and the preparation section coordinates the second feature vector with the standard vector according to the path search result to generate the adaptive vector.

Takagi teaches that the preparation section compares the first feature vector (input) with the standard vector (reference patterns) to obtain a path search result (result of matching, col. 6, lines 65-67 and col. 7, line 1); and

the preparation section coordinates the second feature vector (input pattern) with the standard vector (reference patterns) according to the path search result (result of matching) to generate the adaptive vector (adaptive reference pattern, col. 7, lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Shozakai so that the preparation section compares the first feature vector with the standard vector to obtain a path search result and the preparation section coordinates the second feature vector with the standard vector according to the path search result to generate the adaptive vector as taught by Takagi because it is a common method to create an adaptable model and hence would be easy to utilize and implement.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hirayama (U.S. Pat. 5,854,999), Eberman et al. (U.S. Pat. 5,924,065), Gong et al. (U.S. Pat. 6,658,385), Cope et al. (U.S. Pat. 6,529,866), Minami et al. (U.S. Pat. 5,721,808), and Hermansen (U.S. Pat. 6,510,408) teach methods for training a speech recognition system for noise resistant models.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J Sked whose telephone number is (703) 305-8663. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis Smits can be reached on (703) 306-3011. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MS
10/25/04

SUSAN MCFADDEN
PRIMARY EXAMINER